Compact High Efficiency Natural Gas Liquefier: LNG Technology delivers energy cheaper, where needed

Affordable energy is emerging as a key issue in the first decade of the 21st century. Both developed and developing nations are anxiously searching for alternative energy sources and technologies to use them.

Researchers at Idaho National Laboratory have developed a novel technology that for the first time enables use of small-scale Liquid Natural Gas systems to expand the use of clean fuel at an affordable cost.

“For the first time, we have the capability of connecting small liquefaction systems directly to a transmission line at selected points,” said INL engineer Terry Turner. “This process avoids costly pretreatment and uses pressure letdown energy from the pipeline to liquefy natural gas. The plant operating costs are competitive with large systems.”

“The INL-developed system incorporates a novel solid separation process and development of sophisticated software and process control systems,” said INL engineer Bruce Wilding.

Though some said this couldn’t be achieved, the patented breakthroughs offer previously unrealized benefits, including:

- Lower capital cost to build and operate as compared to competing systems today;
- Plants that pay for themselves within two years, assuming a small profit of 10 cents per gallon;
- Very small footprint permitting location in even crowded areas;
- Modular systems that are factory fabricated and can fit inside a shipping container for high portability;
- A system that generates little or no hazardous waste materials; and
- Designed to operate during more than a 20-year life cycle.

“Portability, cost and small footprint advantages make this technology ideally suited for many uses,” said Wilding. “Including:

- Replacement of diesel and gasoline for medium- and heavy-duty buses and trucks,
- Utilities for peak shaving and use in remote areas, and

- Making use of inaccessible natural gas resources in developing countries.”

These technologies have great economic benefit, while simultaneously contributing to environmental improvements. More importantly, the deployment of this technology could reduce oil imports and increase energy independence.